

**REMARKS**

Reconsideration and allowance of the present application are respectfully requested. By this Amendment, Applicant has amended claims 8, 10, 25 and 27 to address technical informalities and not for any reasons with regard to the patentability of the subject matter. Claims 1-33 remain pending.

In the Office Action, the Examiner indicated that Applicant's Information Disclosure Statements filed November 26, 2003 and May 10, 2004, have not been considered; objected to claims 8, 10, 15, 25 and 27 for including informalities; rejected claims 1, 2, 8 and 19 under 35 U.S.C. § 103(a) as allegedly not being patentable over U.S. Patent No. 5,657,422 to *Janiszewski et al.* ("*Janiszewski*") in view of Wee-Soon Ching and Peng-Seng Toh, *Enhancement of Speech Signal Corrupted by High Acoustic Noise*, IEEE TENCON '93 Proceedings, Computer, Communication, Control and Power Engineering, 1993 ("*Ching*"); rejected claims 3 and 20 as allegedly not being patentable over the purported combination of *Janiszweski* and *Ching* in view of U.S. Patent No. 6,182,035 to *Mekuria*; rejected claims 7-9 and 24 to 2 as allegedly not being patentable over the purported combination of *Janiszweski* and *Ching* in view of U.S. Patent No. 5,572,623 to *Pastor*; rejected claims 14, 15 and 31 under 35 U.S.C. § 103(a) as allegedly not being patentable over the purported combination of *Janiszweski* and *Ching* in view of Rezayee, Afshin and Saeed Gzor. "An Adaptive KLT Approach for Speech Enhancement." *IEEE Transactions on Speech and Audio Processing*, vol. 9, issue 2, Feb. 2001 ("*Raezayee*"); and objected to claims 5, 6, 10-13, 16, 17, 22, 23, 27-30,

32 and 33 for including allowable subject matter but being dependent from an allowable base claim.<sup>1</sup>

Applicant traverses the Examiner's objections and rejections in light of the amendments above and the remarks that follow.

#### Information Disclosure Statements

Applicant acknowledges that the Information Disclosure Statements filed November 26, 2003 and May 10, 2004 have not been considered by the Examiner. (Office Action, p. 2, ¶ 3.) With respect to the Korean Patent Publication 2002-0030693 cited in the first Information Disclosure Statement of November 26, 2003, the concise English language statement is found at page 2 of the concurrently filed specification. With respect to German Patent Publication DE 10026872 cited in the Second Information Disclosure Statement of May 10, 2004, the accompanying European Search Report supplied the statement of relevance as seen by the European Examiner in corresponding European application. Hence, both Information Disclosure Statements were compliant at the time of their filing, and consideration is respectfully requested.

#### Claim Objections

Applicant has amended claims 8, 10, 25 and 27 to address the informalities identified by the Examiner. (Office Action, pp. 2-3.) Accordingly, Applicant respectfully requests that the objection to these claims be withdrawn.

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<sup>1</sup> The Office Action contains statements characterizing the claims and related art. Regardless of whether any such statements are specifically addressed herein, Applicant's silence as to these characterizations should not be construed as acceptance of them.

The Examiner's objections include a requirement to delete "[ ]" in claims 7 and 15 of the previous Amendment. Applicant advises that "[ ]" is a marking used to indicate a deletion. (See M.P.E.P § 714.11.C(B), (8th ed. revised Aug. 2006).) Accordingly, this marking is not included in the present claim listing (nor is the blank space that was deleted by the marking).

Rejections of Claims 1, 2, 4, 18, 19 and 21 Under 35 U.S.C. §103(a)

In order to establish a prima facie case of obviousness, three basic criteria must be met. First, the prior art references must teach or suggest all the claim elements. Second, there must be some reason, suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or to combine reference teachings. Third, there must be a reasonable expectation of success. (See M.P.E.P § 2143.) The rejection of claim 1 is improper and should be withdrawn because the combination of *Janiszewski* and *Ching* fails in all three respects.

*Janiszewski* discloses a system for improving sound quality in a digital mobile radio receiver operating in the presence of audio background noise. (*Janiszewski*, col. 1:7-9.) The system includes a demodulator 20, channel decoder 30, signal line 35, speech decoder 40, and a voice activity detection driven noise remediator (VADDNR) 50. (*Janiszewski*, cols. 3:51 - 4:6, FIG. 1.) Voice activity detection driven noise remediator 50 includes, *inter alia*, a voice activity detector 230 and a speech attenuator/comfort noise inserter 270. (*Id.* at p. 7:16-26.) The Examiner apparently asserts that channel decoder 30, speech attenuator/comfort noise inserter 270, voice activity detector 230, voice activity detection driven noise remediator 50 correspond

to Applicant's claimed "preprocessing unit," "whitening unit," "frame state determining unit," "voice region detection unit," respectively. (Office Action, p. 4.)

The Examiner concedes that *Janiszewski* fails to disclose or suggest "a random parameter extraction unit," as recited in Applicant's claim 1, and relies on *Ching* for allegedly disclosing this feature. (Office Action, p. 4:18-20.) *Janiszewski*, however, also fails to teach other features included in Applicant's claim 1.

First, because *Janiszewski* does not disclose the claimed "random parameter extraction unit," the reference also cannot disclose or suggest a "frame state determining unit for classifying the frames ... based on the random parameters extracted from the random parameter extraction unit" (emphasis added), as recited in Applicant's claim 1.

In addition, Applicant's claim 1 recites "a whitening unit for combining white noise with the frames input from the preprocessing unit" As noted above, the Examiner appears to assert that *Janiszewski*'s channel decoder 30 and speech attenuator/comfort noise inserter 270 correspond to the claimed "preprocessing unit" and "whitening unit." (Office Action, p. 4:4-8.) However, speech attenuator/comfort noise inserter 270 is included in voice activity detection driven noise remediator 50 and receives its input from speech decoder 40, and not from channel decoder 30 . (*Janiszewski*, FIGs. 1 & 2.) Accordingly, speech attenuator/comfort noise inserter 270 cannot be considered to correspond to Applicant's claimed "a whitening unit for combining white noise with the frames input from the preprocessing unit" (emphasis added), as recited in Applicant's claim 1.

Although voice activity detection driven noise remediator 50 receives a signal from channel decoder 30 over signal line 35, the signal is a vertical sum excited linear prediction (VSLEP) coded frame energy value  $r_0$  representing the average signal power in the input speech over a frame. (*Janiszewski*, col. 4 :14-20; FIG. 1.) Thus, the  $r_0$  signal received is not a "frame" of an "input voice signal," as recited in claim 1. Accordingly, the voice activity detection driven noise remediator 50 cannot correspond to Applicant's claimed "whitening unit" for this reason as well.

*Ching* does not cure the above-noted deficiencies of *Janiszewski*. The Examiner cites *Ching* for its alleged disclosure of "finding of frame-to-frame randomness that is input from [a] signal." (Office Action, p. 4:19-21.) However, *Ching* says nothing with regard to "a whitening unit," or a "frame state determining unit." Thus, *Ching* does not disclose or suggest a "random parameter extraction unit ... from the frames input from the whitening unit" or a "frame state determining unit for classifying the frames ... based on the random parameters extracted from the random parameter extraction unit" (emphasis added), as recited in Applicant's claim 1.

Therefore, when *Janiszewski* and *Ching* are taken individually or in combination, the references fail to disclose or suggest, at least, "a whitening unit for combining white noise with the frames input from the preprocessing unit; a random parameter extraction unit for extracting random parameters indicating the randomness of frames from the frames input from the whitening unit; [and] a frame state determination unit for classifying the frames into voice frames and noise frames based on the random parameters extracted by the random parameter extraction unit" (emphasis added), as recited in Applicant's claim 1. Accordingly, the applied

references cannot support a *prima facie* case for rejecting claim 1 under 35 U.S.C. § 103(a).

In addition, there would be no motivation for one of ordinary skill in the art to combine *Janiszewski* and *Ching*. The Examiner asserts that the motivation to combine *Janiszewski* and *Ching* “involve[s] the reduction of noise by frame and to make use of any correlation between frames.” (Office Action, p. 5:2-6, *citing Ching*, p. 115, para. 3.) To the contrary, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. (*In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).) Nothing in *Janiszewski* or *Ching* suggests or provides a reason for the desirability of the combination made by the Examiner. The motivation provided by the Examiner is so broad that it would not motivate the specific combination of one portion of a noise reduction system with another in a way that meets the present claims. Such motivation is insufficient to a *prima facie* case of obviousness. Applicant respectfully submits that the Examiner has simply combined *Janiszewski* and *Ching* based on knowledge gleaned from Applicant's own disclosure. (See, e.g., Specification, pp. 5:14-6:2.) Such improper hindsight reconstruction of cannot support a *prima facie* case of obviousness under 35 U.S.C. 103(a).

Moreover, one of ordinary skill in the art would have no reasonable expectation that the purported combination of *Janiszewski* and *Ching* would be successful. *Janiszewski* discloses that, when no speech is present, the system attenuates the signal and inserts white noise. (*Janiszewski*, col. 3:4-11) There is no



reason an artisan would combine these portions of *Janiszewski* with *Ching's* method to retain low energy speech and reduce noise. (*Janiszewski*, col. 3:4-11; *Ching*, 1115, second col., third para.) Indeed, the portions of the references relied on by the Examiner appear to work in opposite fashions. Claim 1 is, therefore patentable over *Janiszewski* and *Ching* for this reason as well.

For the reasons stated above, the purported combination of *Janiszewski* and *Ching* cannot support a *prima facie* case of obviousness for rejecting claim 1 under 35 U.S.C. § 103(a). Thus, claim 1 is patentable over the applied references; and claims 2 and 4 are also patentable at least due to their dependence from claim 1.

Claim 18, although of different scope than claim 1, recites features similar to those recited in claim 1. Accordingly, claim 1 is patentable over *Janiszewski* and *Ching* for the same reasons set forth above with regard to claim 1. Claims 19 and 21 are patentable over the applied references at least due to their dependence from claim 1.

Rejections of Claims 3, 7-9, 14, 15, 20 24-26, and 31 Under 35 U.S.C. §103(a)

Claims 3, 7-9, 14, 15, 20, 24-26 and 31 are rejected under 35 U.S.C. § 103(a) based on purported combination of *Janiszewski* and *Ching* in father view of one or more of *Mekuria*, *Pastor*, and *Rezayee*. Claims 3, 7-9, 14, 15, 20, 24-26 and 31 depend from independent either claim 1 or claim 18 and, therefore, include all the limitations of the independent claim from which they depend. *Janiszewski* and *Ching* fails to disclose or suggest the above-noted features of claims 1 and 18. (See *supra*.) Thus, *Janiszewski* and *Ching* also fail to disclose or suggest the same

features of claims 3, 7-9, 14, 15, 20, 24-26 and 31. *Mekuria*, *Pastor*, and *Rezayee* do not cure the deficiencies of *Janiszewski* and *Ching*.

The Examiner apparently cites *Mekuria* for its alleged disclosure of "overlapping of frames" (Office Action, p. 6:2-3.), *Pastor* for its alleged disclosure of "vocal and fricative frames" (*Id* at 6:13-14), and *Rezayee* for its alleged disclosure of "enhancement of speech from colored noise" (*Id* at 7:11-12.) However, *Mekuria*, *Pastor*, and *Rezayee* do not disclose the above-noted features of claims 1 and 18 missing from *Janiszewski* and *Chin*, and the Examiner does not allege that *Mekuria*, *Pastor*, and *Rezayee* make any such disclosure. Accordingly, *Janiszewski*, *Ching*, *Mekuria*, *Pastor*, and *Rezayee*, whether taken alone or in any combination, fail to disclose or suggest the above-noted features of claims 1 and 18. Thus, these references also fail to disclose or suggest the same features of claims 3, 7-9, 14, 15, 20, 24-26 and 31. Accordingly, claims 3, 7-9, 14, 15, 20, 24-26 and 31 are, therefore patentable over the applied references.



### Conclusion

Based on the reasons as set forth above, Applicant respectfully requests allowance of all pending claims. In the event that there are any questions concerning this paper, or the application in general, the Examiner is respectfully urged to telephone Applicant's undersigned representative so that prosecution of the application may be expedited.

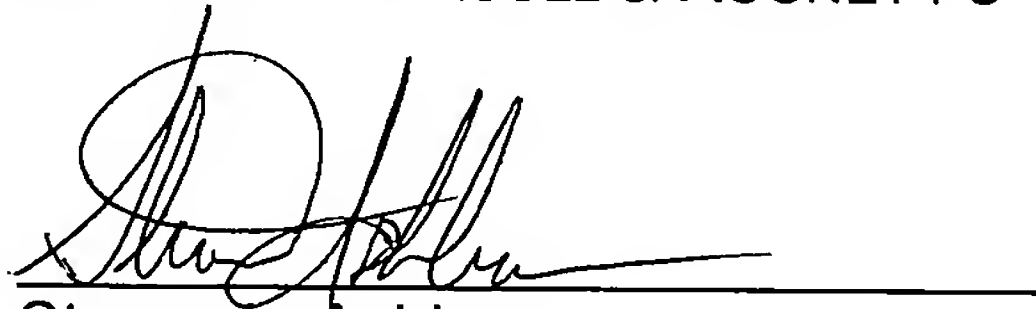
It is believed that this Response and Amendment does not require additional fees. However, if additional fees are required for any reason, please charge Deposit Account No. 02-4800 the necessary amount.

Respectfully submitted,

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